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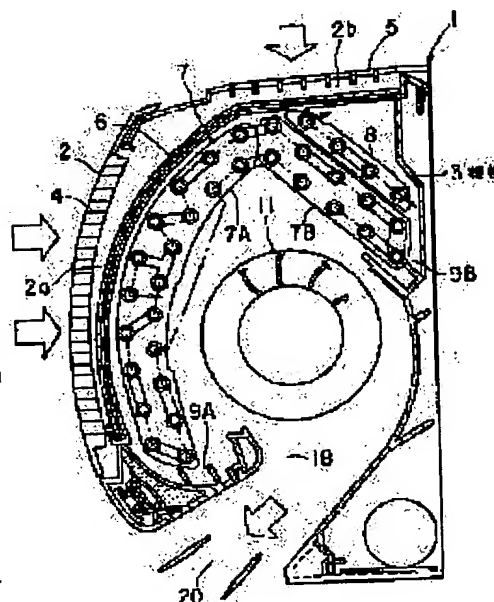
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(54) INDOOR UNIT FOR AIR CONDITIONER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an indoor unit for an air conditioner, capable of securing comfortable air conditioning by achieving effective treatment of drain and preventing dew from being produced, and capable of reducing the cost of the indoor unit by simplifying the manufacture and assembly of the same.

SOLUTION: An indoor unit is provided with a unit main body 1 having inlet ports 2a, 2b and an outlet port 20 and being formed of a front panel 2 and a rear plate 3, a heat exchanger 7 which is formed into an inverted V-shape when viewed from its side face and composed of a front side heat exchanger 7A and a rear side heat exchanger 7B, and a blower 11 for sucking air to be cooled in an air-conditioning chamber through the inlet ports to be allowed to flow through the heat exchangers and blowing the cooled air from the outlet port through an air blow passage after heat-exchanging is carried out. Further, the indoor unit is provided with a fore drain pan 9A and an aft drain pan 9B, each being arranged under the front side heat exchanger and the rear side heat exchanger, respectively, and right and left gutters which are positioned inside the air blow passage and mounted so as to extend between the fore drain pan and the aft drain pan for guiding and sending drain collected in the aft drain pan into the fore drain pan.



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CLAIMS

[Claim(s)]

[Claim 1] The unit body which is equipped with sink opening and an exit cone, and consists of a front panel and a backplate, The heat exchanger which consists of side heat exchangers after being located in a side heat exchanger and rear-face side before being arranged in this unit body and located in the front-face side of the shape of reverse V character, and the nothing and the above-mentioned unit body by side view, In the indoor unit of the air conditioner possessing the blower which ventilates from an exit cone through a forced draft air duct after inhaling air-conditioned-room-ed air from the above-mentioned absorption opening, circulating the above-mentioned heat exchanger and carrying out heat exchange here Before constituting the above-mentioned heat exchanger, a side heat exchanger and a backside heat exchanger each The front drain pan and back drain pan which are arranged at the lower part, The indoor unit of the air conditioner characterized by providing the gutter which carries out circulation guidance of the drain water which was located inside the above-mentioned forced draft air duct, and was continued and constructed over a front drain pan and both back drain pans, and was caught by the back drain pan to a front drain pan.

[Claim 2] All the above-mentioned gutters that open the drain pan before the above, a back drain pan, and these for free passage are the indoor units of the air conditioner according to claim 1 characterized by being formed in the above-mentioned backplate in one.

[Claim 3] The rib which constitutes a front [above] drain pan and a back drain pan is the indoor unit of the air conditioner according to claim 2 characterized by being mutually projected and formed in the same include angle of the same direction.

[Claim 4] The above-mentioned gutter is the indoor unit of claim 1 characterized by being prepared along with the side edge section of the above-mentioned forced draft air duct, and an air conditioner according to claim 2.

[Claim 5] The edge of the drain pan after the above is the exhaust-port soma which carries out opening to down. The above-mentioned gutter The vertical section which is opened for free passage by the receptacle section which receives the drain water moreover drained by the edge from the exhaust-port soma of a back drain pan, and this receptacle section, and is located in the background of the above-mentioned blower, The indoor unit of the air conditioner according to claim 4 characterized by consisting of horizontal levels which extend along with the lower part side of a blower from this perpendicular subordinate edge, and are open for free passage to the drain pan before the above.

[Claim 6] The above-mentioned gutter is the indoor unit of claim 4 characterized by attaching the lid implement which closes up opening along with the up opening, and an air conditioner according to claim 5.

[Claim 7] The above-mentioned lid implement is the indoor unit of the air conditioner according to claim 6 characterized by for the edge of the part which closes the vertical section of the above-mentioned gutter being the pipe section, and being fitted in the exhaust-port soma of the drain pan after the above.

[Claim 8] The above-mentioned lid implement is the indoor unit of claim 6 to which even the motor which carries out press immobilization of the fan motor of the above-mentioned blower at a backplate is characterized by connecting an ingredient, and an air conditioner according to claim 7 through the hinge region prepared in the edge by the side of a front drain pan.

[Claim 9] The above-mentioned lid implement is the indoor unit of claim 6 characterized by connecting the bearing base which has the bearing implement of the above-mentioned blower through the string section prepared in the edge by the side of a front drain pan, and an air conditioner according to claim 7.

[Claim 10] The above-mentioned lid implement is the indoor unit of claim 6 characterized by the top face serving as the lap section which carries out a lap to the end plate of the cross flow fan which constitutes the above-mentioned blower thru/or an air conditioner according to claim 9.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the indoor unit of the air conditioner equipped with the heat exchanger formed in the shape of reverse V character, and relates to amelioration of the processing structure of the drain water especially dropped from the above-mentioned heat exchanger.

[0002]

[Description of the Prior Art] The air conditioner generally used consists of an indoor unit arranged at an air conditioned room-ed, and an outdoor unit arranged on the outdoors, and comes to connect both these units by the refrigerant pipe and electric wiring.

[0003] From a user side, the miniaturization to these units and the request of installation tooth-space reduction are size, and increase of heat exchange capacity must be aimed at in each manufacturer, satisfying such conditions.

[0004] As one of the solution of that, there is an indoor unit of the air conditioner which formed in the shape of reverse V character so that a body and a front panel might be countered, respectively, has arranged the heat exchanger which consists of a before side heat exchanger and a backside heat exchanger, and has arranged the blower in the lower part of this heat exchanger so that it may be indicated by JP,4-106425,U.

[0005] If it is the heat exchanger of such a gestalt, while securing heat exchange area enough, the height dimension of the heat exchanger itself was controlled and reduction-ization of the height dimension of a unit body has been obtained by it.

[0006]

[Problem(s) to be Solved by the Invention] By the way, if it has the heat exchanger formed such in the shape of reverse V character, drain water will be generated by a before side heat exchanger and the backside heat exchanger with a heat exchange operation at coincidence. These drain water is dropped at the drain pan arranged at the lower part of each heat exchanger, and is caught.

[0007] Although there is also no problem [processing / drain water], to the front panel and a backplate, the front drain pan which receives the drain water of a before side heat exchanger, and the back drain pan which receives the drain water of a backside heat exchanger are manufactured separately, respectively, and is assembled.

[0008] Therefore, there is generating of the noise (PISHI sound) by thermal expansion etc. from a mutual joining segment in the condition of components mark having increased, and metal mold cost required manufacturing each having had a bad influence on cost, and having assembled.

[0009] Although the drain water which caught water with the back drain pan of the backside heat exchanger lower part is drained from two or more exhaust ports in which it is prepared here, since the inside of a back drain pan has negative pressure at the time of blower rotation, the raw air before heat exchange will be inhaled from an exhaust port.

[0010] Consequently, it is easy to be generated with dew in the peripheral face of a back drain pan, and since these dew is dropped at a forced draft air duct and it blows off to an air conditioned room-ed with heat exchange air, comfortable air-conditioning is spoiled.

[0011] While this invention is made in view of the above-mentioned situation, preventing generation of dew condensation in response to the drain water generated by this heat exchanger on the assumption that the place made into that purpose is equipped with the heat exchanger formed in the shape of reverse V character and securing comfortable air-conditioning, simplification of manufacture and an assembly tends to be attained and it is going to offer the indoor unit of the air conditioner which can obtain reduction of cost.

[0012]

[Means for Solving the Problem] In order to satisfy the above-mentioned purpose, the indoor unit of the air conditioner of this invention The unit body which is equipped with absorption opening and an exit cone, and consists of a front panel and a backplate as claim 1, The heat exchanger which consists of rear-face side heat exchangers located in a side heat exchanger and the backside before being arranged in this unit body and located in the front-face side of the shape of reverse V character, and the nothing and the above-mentioned unit body by side view, Inhale air-conditioned-room-ed air from the above-mentioned absorption opening, and the above-mentioned heat exchanger is circulated. After carrying out heat exchange here, before providing the blower which ventilates from an exit cone through a forced draft air duct and constituting the above-mentioned heat exchanger, a side heat exchanger and a backside heat exchanger each The front drain pan and back drain pan which are arranged at the lower part, It is located inside the above-mentioned forced draft air duct, and is continued and constructed over a front drain pan and both back drain pans, and is characterized by providing the gutter which carries out circulation guidance of the drain water caught by the back drain pan to a front drain pan.

[0013] As claim 2, all the above-mentioned gutters that open the drain pan before the above according to claim 1, a back drain pan, and these for free passage are characterized by being formed in the above-mentioned backplate in one.

[0014] As claim 3, the rib which constitutes a front [the above according to claim 2] drain pan and a back drain pan is characterized by being mutually projected and formed in the same include angle of the same direction. As claim 4, claim 1 and the above-mentioned gutter according to claim 2 are characterized by being prepared along with the side edge section of the above-mentioned forced draft air duct.

[0015] As claim 5, the edge of the drain pan after the above according to claim 4 is the exhaust-port soma which carries out opening to down. The above-mentioned gutter The vertical section which is opened for free passage by the receptacle section which receives the drain water moreover drained by the edge from the exhaust-port soma of a back drain pan, and this receptacle section, and is located in the background of the above-mentioned blower, Along with

the lower part side of a blower, it extends from this perpendicular subordinate edge, and is characterized by consisting of horizontal levels which are open for free passage to the drain pan before the above.

[0016] As claim 6, claim 4 and the above-mentioned gutter according to claim 5 are characterized by attaching the lid implement which closes up opening along with the up opening. As claim 7, the above-mentioned lid implement according to claim 6 is characterized by for the edge of the part which closes the vertical section of the above-mentioned gutter being the pipe section, and being fitted in the exhaust-port soma of the drain pan after the above.

[0017] As claim 8, even the motor which carries out press immobilization of the fan motor of the above-mentioned blower at a backplate is characterized by connecting an ingredient through the hinge region by which claim 6 and the above-mentioned lid implement according to claim 7 are formed in the edge by the side of a front drain pan.

[0018] As claim 9, claim 6 and the above-mentioned lid implement according to claim 7 are characterized by connecting the bearing base which has the bearing implement of the above-mentioned blower through the string section prepared in the edge by the side of a front drain pan.

[0019] As claim 10, claim 6 thru/or the above-mentioned lid implement according to claim 9 are characterized by the top face serving as the lap section which carries out a lap to the end plate of the cross flow fan which constitutes the above-mentioned blower.

[0020] Since it let drain water pass to the forced draft air duct inside in invention of claim 1 by having above The means for solving a technical problem, the hole which once takes out the drain water dropped from the backside heat exchanger to the exterior becomes unnecessary, therefore it is not necessary to inhale external raw air, and there is no phenomenon with dew.

[0021] In invention of claim 2, while being able to obtain the improvement of assembly precision to ventilation systems, such as a blower and a nose, by unifying an order drain pan, generating of the noise (PISHI sound) by thermal expansion etc. is prevented.

[0022] In invention of claim 3, since the protrusion direction was made into the same direction also with the order drain pan, in these manufactures, the direction of mold omission from metal mold is in agreement, and it ends with the metal mold of a simple configuration.

[0023] In invention of claim 4, since the gutter was located in the side edge section of a forced draft air duct, while there is little effect affect the ventilation engine performance, there is little effect on the drain water by the wind of a blower, and it ends.

[0024] In invention of claim 5, although the back drain pan has negative pressure from a setup of that location and the air from a back drain pan is inhaled from an exhaust-port soma, this air is the air which heat exchange is already carried out by the heat exchanger, and can draw a forced draft air duct, and does not have generating with dew.

[0025] In invention of claim 6, since up opening of a gutter is closed with a lid implement, invasion of the dust into a gutter is prevented and plugging in the gutter by dust is prevented. In invention of claim 7, since the lid implement corresponding to the vertical section of a gutter is formed in the shape of a pipe, drain water does not ooze from the clearance between a lid implement and a gutter to the exterior.

[0026] In invention of claim 8, an ingredient can be moved to a before side from a backplate, and even a motor can do cleaning and exchange of a fan motor easily. And two components with an ingredient are formed by one, and even a lid implement and a motor obtain reduction and cost reduction of components mark.

[0027] In invention of claim 9, the bearing base can move freely and can maintain exchange of a blower etc. easily. And two components of a lid implement and the bearing base are formed by one, and reduction and cost reduction of components mark are obtained. In invention of claim 10, when a lid implement top face serves as the lap section which carries out a lap to the end plate of the cross flow fan which constitutes a blower, ventilation performance degradation can be prevented certainly.

[0028]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. As shown in drawing 1 , the indoor unit of an air conditioner is

constituted. The unit body 1 which is an air-conditioner body consists of a front panel 2 and a backplate 3 mentioned later. Opening of the anterior part absorption opening 2a in which the grill 4 was inserted is carried out to the front-face side of the above-mentioned front panel 2, and opening of the up inlet port 2b with which the grill 5 was inserted in the top face is carried out. [0029] In the unit body 1, the air filter 6 curved in the shape of [loose] radii so that each inlet port 2a and 2b may be continued and countered, and the heat exchanger 7 formed in the shape of reverse V character are arranged.

[0030] A heat exchanger 7 consists of side heat exchanger 7A, after countering side heat exchanger 7A and high suction 2b before countering anterior part absorption opening 2a. Especially, the auxiliary heat exchanger 8 is arranged along the top face of backside heat exchanger 7B, and it intervenes between high suction 2bs.

[0031] Before constituting this heat exchanger 7, while the side heat exchanger 7A lower limit section is in a low location and front drain pan 9A is arranged at this lower part, the backside heat exchanger 7B lower limit section is in a high location, and back drain pan 9B is arranged at this lower part. These fronts, while the back drain pans 9A and 9B are formed in the above-mentioned backplate 3 at one, as shown in drawing 10, rib 91A which constitutes front drain pan 9A, and rib 91B which constitutes back drain pan 9B protrude in the same direction. In addition, in this drawing, 90A-90E are the metal mold for carrying out injection molding of the backplate 3.

[0032] It is arranged between the internal location of the above-mentioned heat exchanger 7 formed in the shape of reverse V character, i.e., before [this] side heat exchanger 7A, and backside heat exchanger 7B, and as it is covered with these heat exchangers, the indoor blower 11 is arranged.

[0033] As shown also in drawing 2, the above-mentioned indoor blower 11 consists of bearing implements 14 which support pivotably pivot 12a which protrudes on end plate 12c of the other flanks of the cross flow fan 12 of the same shaft-orientations dimension as the width method of the above-mentioned heat exchanger 7, and the fan motor 13 connected with end plate 12b by the side of the 1 flank of this cross flow fan 12 through revolving-shaft 13a and a cross flow fan 12.

[0034] On the other hand, the 1st blower supporter 15 is formed in one at one flank (right-hand side section) of the longitudinal direction of the above-mentioned backplate 3, and the 2nd blower supporter 16 is formed in other flanks (left-hand side section) at one.

[0035] Cavity formation is carried out by the width method of these blowers supporters 15 and 16 the inside section is narrow, and this cavity is called right gutter 17A and left gutter 17B, respectively. And the forced draft air duct 18 is formed, predetermined spacing is consisted here at a longitudinal direction, and rib 19 -- for reinforcement protrudes both gutter 17A and between 17B.

[0036] Opening of the exit cone 20 is carried out along the near-side edge of the above-mentioned forced draft air duct 18. Drain pan 9A before the above will be prepared along the near-side edge of this exit cone 20, and drain pan 9B after the above will be prepared along with the upper part side of the above-mentioned forced draft air duct 18.

[0037] The upper limit section is open for free passage with the both-sides edge of back drain pan 9B, and the lower limit section is opening the above-mentioned right-and-left gutters 17A and 17B for free passage with the both-sides edge of front drain pan 9A. That is, both the gutters 17A and 17B constitute the free passage way which opens back drain pan 9B and front drain pan 9A for free passage.

[0038] The fan motor 13 which constitutes the indoor blower 11 is supported, and further, an ingredient 21 presses down even a motor in the blower supporter 15 of the above 1st, and this fan motor 13 is attached in the 1st blower supporter 15, and is fixed to it.

[0039] The bearing base 22 where support immobilization of the bearing implement 14 which constitutes the indoor blower 11 was carried out is attached in the 2nd blower supporter 16.

**** implement 23A and **** implement 23B are connected with an ingredient 21 and the bearing base 22 even for the above-mentioned motor at one, respectively. These right-and-left lid implements 23A and 23B are inserted in the above-mentioned right-and-left gutters 17A and

17B formed inside each blower supporters 15 and 16, respectively, and close this up opening. [0040] Next, the supporting structure of the fan motor 13 in the blower supporter 15 of the above 1st is explained in full detail. As shown in drawing 3, the radii-like forced draft air duct end plate 25 is set up, a common-law marriage consists this forced draft air duct end plate 25 and predetermined spacing, and corrosion-plate 26A which constitutes the 1st blower supporter 15 is set up by the side edge section of a forced draft air duct 18.

[0041] The space section between these forced draft air duct end plate 25 and corrosion-plate 26A is the above-mentioned right gutter 17A. If it puts in another way, cavity formation will be carried out between the forced draft air duct end plate 25 and corrosion-plate 26A, and right gutter 17A will be formed in a backplate 3 along the inside edge of a forced draft air duct 18 at one.

[0042] As shown in drawing 9, the exhaust-port soma 27 which carries out opening caudad is formed in the side edge section of back drain pan 9B, and it is open for free passage to receptacle section 28a which is the upper limit of right gutter 17A. The lower part part of this receptacle section 28a is vertical section 28b, extends almost horizontally from a vertical section 28b lower limit, and has become horizontal level 28c which that front end section opens for free passage to the drain pan before the above.

[0043] To the cross flow fan 12 which constitutes the above-mentioned indoor blower 11 from a condition of having been assembled, vertical section 28b of right gutter 17A will be located in the background of a cross flow fan 12, and horizontal level 28c will be located in the lower part side of a cross flow fan 12.

[0044] As again shown in drawing 3, the edge of the above-mentioned corrosion-plate 26A is formed in the shape of a semicircle. Backing plate 26B is set up in parallel with this corrosion-plate 26A, and this edge is formed in the shape of [than the corrosion-plate edge / to some extent bigger] a semicircle.

[0045] The flank of the above-mentioned backing plate 26B is formed in the shape of [of big radius of curvature] radii, and calls this a supporter 28. **** implement 23A is attached in above-mentioned right gutter 17A. That is, a cross section is formed in the shape of U character, the upper part is opened wide, and both receptacle section 28a, vertical section 28b, and horizontal level 28c that constitute right gutter 17A are closed by **** implement 23A by which a cross section is formed in inverted-L-shaped in this opening.

[0046] Especially the edge corresponding to receptacle section 28a and vertical section 28b of **** implement 23A is equipped with the cross-section rectangle-like pipe section 29. And this pipe section 29 is fitted in the exhaust-port soma 27 of drain pan 9B after the above.

[0047] As for the above-mentioned pipe section 29 of **** implement 23A, and the edge of the opposite side, an ingredient 21 is connected with one even for the above-mentioned motor through the so-called P-P hinge region 30. An ingredient 21 consists of the presser-foot section 31 in which even the above-mentioned motor is formed in the shape of a semicircle, presser-foot plates 32a and 32b of this presser-foot section 31 which consist a narrow gap in a center section mutually mostly, and protrude on one, **** implement 23A, and lock out Itabe 33 who protrudes on one to the method of outside along with presser-foot section 31 side edge of the part which counters.

[0048] The common-law marriage of the above-mentioned presser-foot plate 32a is formed in the shape of [of the same curvature as a corrosion-plate 26A common-law marriage] a semicircle, and the above-mentioned presser-foot plate 32b common-law marriage is formed in the shape of [of the same curvature as a backing plate 26B common-law marriage] a semicircle. Moreover, the above-mentioned presser-foot section 31 is the same radius of curvature as a **** implement 23A common-law marriage.

[0049] As shown in drawing 4, **** implement 23A is inserted in right gutter 17A, and where up opening of this right gutter is closed, the lap of the **** implement 23A top face is carried out to end plate 12b of a cross flow fan 12. And if even a motor carries out rotation displacement of the ingredient 21 by using a hinge region 30 as the supporting point at a posterior part side, the circular section will be formed in a **** implement 23A common-law marriage and the presser-foot section 31.

[0050] coincidence -- each of corrosion-plate 26A, one presser-foot plate 32a and backing plate 26B, and presser-foot plate 32b of another side -- both common-law marriages counter, the circular section of a predetermined diameter is formed, and the one circular section is formed with the presser-foot section 31 and the supporter 28 of another side.

[0051] As shown in drawing 5, the indoor blower 11 and a heat exchanger 7 are arranged to a backplate 3. Namely, as explained previously, **** implement 23A is fitted into right gutter 17A, and by using a hinge region 30 as the supporting point, even a motor rotates an ingredient 21 to a near side, and the 1st blower supporter 15 is vacated.

[0052] And put the fan motor 13 which constitutes the indoor blower 11 on the 1st blower supporter 15, even a motor rotates an ingredient 21, the peripheral surface of a fan motor 13 is made to meet, and it attaches and fixes to a backplate 3 by the lockscrew 35. (A fixed portion is shown in drawing 9)

In this condition, fitting of the peripheral surface of a fan motor 13 is carried out to the supporter 28 of the 1st blower supporter 15, and the circular section in which the presser-foot section 31 of an ingredient 21 makes even a motor. Moreover, the boss section peripheral surface which protrudes on one flank of a fan motor 13 and which is not illustrated here is pressed down with backing plate 26B, and fitting is carried out to the circular section of plate 32b which both common-law marriages make, respectively.

[0053] The shaft-orientations location of a fan motor 13 is positioned by contacting the circular section which the above-mentioned boss section end face presses down with corrosion-plate 26A, and both the common-law marriages of plate 32a make. Boss section 13b which protrudes on the near side of a fan motor 13 is supported by another presser-foot implement 36 carried out comparatively two, it does in this way, and a fan motor 13 is certainly attached and fixed to a backplate 3.

[0054] Since the bearing implement 14 side is attached as it mentions later, an assembly as shown in this drawing is completed by arranging the above-mentioned heat exchanger 7 in a predetermined location. Next, the supporting structure of the bearing implement 14 in the blower supporter 16 of the above 2nd is explained in full detail.

[0055] As shown in drawing 6, the radii-like forced draft air duct end plate 37 is set up, a common-law marriage consists this forced draft air duct end plate 37 and predetermined spacing, and the backing plate 38 which constitutes the 2nd blower supporter 16 is set up by the side edge section of a forced draft air duct 18.

[0056] The space section between these forced draft air duct end plate 37 and a backing plate 38 is the above-mentioned left gutter 17B. If it puts in another way, cavity formation will be carried out between the forced draft air duct end plate 37 and a backing plate 38, and left gutter 17B will be formed in a backplate 3 along the inside edge of a forced draft air duct 18 at one.

[0057] The back drain pan 9B side edge section by the side of this 2nd blower supporter 16 is the 1st blower section 15 explained previously and the same exhaust-port soma 27, and is open for free passage to receptacle section 28a which is the upper limit of left gutter 17B. And receptacle section 28a is open for free passage to horizontal level 28c through vertical section 28b. Therefore, in the condition of having been assembled, vertical section 28b is located in the background of a cross flow fan 12, and horizontal level 28c is located in the lower part side of a cross flow fan 12.

[0058] **** implement 23B which closes top-face opening of the above-mentioned left gutter 17B is attached. Since it is the same configuration as the 1st blower section 15 which also explained this **** implement 23B previously, a jack per line is attached and new explanation is omitted.

[0059] As for the edge of the opposite side, the above-mentioned bearing base 22 is connected with one through the string section 39 in the pipe section 29. Moreover, the bearing base 22 consists of two or more piece section of anchoring 42 -- and two or more screw-thread pore 43-- equipped with the ring-like attachment section 40, lock out Itabe 41 who protrudes on one to the method of outside around this attachment section 40, and the hole for anchoring.

[0060] As shown in drawing 7, **** implement 23B is inserted in left gutter 17B, and where up opening of a left gutter is closed, the lap of the **** implement 23B top face is carried out to

end plate 12c of a cross flow fan 12. And a backing plate 38 is contacted in the bearing base 22 by using the string section 39 as the supporting point, and lock out Itabe 41 edge is laid in a backing plate 38 upper-limit edge. The hole for anchoring of the piece section 42 of anchoring prepared for lock out Itabe 41 in this condition counters the **** pore (not shown) formed in the backplate 3 like the 1st blower supporter 15 side.

[0061] As shown in drawing 8, the indoor blower 11 and a heat exchanger 7 are arranged to a backplate 3. That is, as explained previously, after fitting **** implement 23B into left gutter 17B, the bearing base 22 is once missed outside from **** implement 23B by using the string section 39 as the supporting point, and the 2nd blower supporter 16 is vacated.

[0062] The bearing implement 14 which constitutes the indoor blower 11 is made to attach in the attachment section 40 of the bearing base 22, this bearing base 22 is moved to the **** implement 23B side from an outside, and pivot 12a of a cross flow fan 12 is inserted in the bearing implement 14.

[0063] After it, since the hole for anchoring of the piece section 42 of anchoring is open for free passage inevitably by laying the bearing base 22 in the 2nd blower supporter 16 to the **** pore prepared in the 2nd blower supporter 16 at one, by the lock screw, the bearing base 22 is attached in a backplate 3, and it fixes.

[0064] And arrange the above-mentioned heat exchanger 7 in a predetermined location, the hole for attachment prepared in this heat-exchanger end plate 7c is made to counter the screw-thread pore 43 of the bearing base 22, and attachment immobilization is carried out by the lock screw 35. Therefore, the bearing base 22 will be attached and fixed to a backplate 3 where the bearing implement 14 is supported.

[0065] Thus, it is the indoor unit constituted, and while making refrigerating cycle operation to a heat exchanger 7, by driving the indoor blower 11 and rotating a cross flow fan 12, the air in an air conditioned room-ed is inhaled in the unit body 1 from anterior part inlet port 2a and up inlet port 2b, a heat exchanger 7 is passed, and heat exchange is made. The heat exchange air after carrying out heat exchange is guided in a forced draft air duct 18, and blows off from an outlet 20 into an air conditioned room-ed.

[0066] In addition, an ingredient 21 and lock out Itabe 33 and 41 who protrudes on one at the bearing base 22, respectively are inserted in the inside edge of a heat exchanger 7 in which even a motor is formed in the shape of reverse V character. Therefore, it prevents that blockade the space formed in the side edge section of the reverse V character-like heat exchanger 7, and raw air is inhaled from here.

[0067] Drain water generates and trickles the case at the time of air conditioning operation into a heat exchanger 7. Front drain pan 9A receives the drain water dropped from before side heat exchanger 7A, and back drain pan 9B receives the drain water dropped from backside heat exchanger 7B and the auxiliary heat exchanger 8.

[0068] From the place which has back drain pan 9B in a high order rather than front drain pan 9A, the drain water caught by back drain pan 9B circulates to the right-and-left gutters 17A and 17B formed in a both-sides edge, and is caught by front drain pan 9A. And it bundles up from front drain pan 9A, and waste water treatment is carried out outdoor.

[0069] Thus, since it is located inside the forced draft air duct 18 along which the air to which heat exchange of the right-and-left gutters 17A and 17B which lead drain water was carried out passes, dew does not stick with cold drain water to the right-and-left gutters 17A and 17B. Furthermore, an external drain hole becomes unnecessary at back drain pan 9B like the configuration of the conventional example, therefore it is not necessary to inhale external raw air, and there is no phenomenon with dew.

[0070] Since there is no connection section in it while being able to obtain the improvement of assembly precision to ventilation systems, such as a blower 11 and a nose, to a backplate 3 by forming the order drain pans 9A and 9B in one, the noise (PISHI sound) by thermal expansion etc. does not occur.

[0071] Furthermore, rib 91A which constitutes front drain pan 9A, and rib 91B which constitutes back drain pan 9B protrude in the same direction. Since the direction of mold omission of front drain pan 9A and back drain pan 9B is in agreement as shown in drawing 10 from this, especially

metal mold 90A can consist of single metal mold among the metal mold 90A-90E for carrying out injection molding of the backplate 3, without constituting separately the object for front drain pan 9A, and the object for back drain pan 9B.

[0072] Since the above-mentioned right-and-left gutters 17A and 17B were located in the side edge section of a forced draft air duct 18, while there is little effect affect the ventilation engine performance, there is little effect on the drain water by the wind of a blower 11, and it ends.

[0073] Although air of back drain pan 9B cannot prevent that the right-and-left gutters 17A and 17B absorb from the exhaust-port soma 27, this air is the air by which heat exchange was already carried out by the heat exchanger 11, therefore does not have generating with dew.

[0074] Since top-face opening of the right-and-left gutters 17A and 17B is closed with the right-and-left lid implements 23A and 23B, respectively, invasion of the dust into a gutter can be prevented certainly and plugging of the interior by dust is prevented.

[0075] That is, since it considered as the pipe section 29 although there was a possibility that drain water might ooze from the clearance between the right-and-left lid implements 23A and 23B and the right-and-left gutters 17A and 17B to the exterior when it considered as a U character-like lid to vertical section 28b, drain water does not trespass upon the clearance between vertical section 28b of the right-and-left gutters 17A and 17B, and the right-and-left lid implements 23A and 23B, and it does not ooze from this clearance.

[0076] Since it was made to carry out the lap of right-and-left lid implement 23A and the 23B top face to the right-and-left end plates 12b and 12c of a cross flow fan 12, the recess of the air end plate 12b of the right and left from a forced draft air duct 18 and near 12c can be prevented as much as possible, and ventilation performance degradation can be prevented certainly.

[0077] An ingredient 21 can use a hinge region 30 as the supporting point even for the above-mentioned motor, it can move to a near side from a backplate 3 side, and this can perform easily a maintenance of cleaning of a cross flow fan 12, exchange, etc.

[0078] In addition, although even a motor can move an ingredient 21 for the above-mentioned activity, since there is a possibility of escaping from and coming out of inserted-in right gutter 17A when **** implement 23A follows and moves at this time, don't move.

[0079] Therefore, even a motor connects **** implement 23A with an ingredient 21 through [30] a hinge region, and it was made for a motion of an ingredient 21 not to affect **** implement 23A even in a motor. Furthermore, even **** implement 23A and a motor form two components with an ingredient 21 in one, and reduction and cost reduction of components mark are obtained.

[0080] To a backplate 3, since, the above-mentioned bearing base 22 can be moved all around, and it can perform easily a maintenance of cleaning of a cross flow fan 12, exchange, etc. by this.

[0081] Although the bearing base 22 can move for the above-mentioned activity, since there is a possibility of escaping from and coming out of left gutter 17B when **** implement 23B follows and moves at this time, don't move.

[0082] Therefore, **** implement 17B is connected with the bearing base 22 through the string section 39, and it was made for a motion of the bearing base 22 not to affect **** implement 17B. Furthermore, two components of **** implement 17B and the bearing base 22 are formed in one, and reduction and cost reduction of components mark are obtained.

[0083]

[Effect of the Invention] Since it let drain water pass inside the forced draft air duct according to invention of claim 1 as explained above, the hole which once takes out the drain water dropped from the backside heat exchanger to the exterior becomes unnecessary, therefore it is not necessary to inhale external raw air, and there is no phenomenon with dew.

[0084] And since drain water lets the inside of the forced draft air duct along which the air by which heat exchange was carried out passes pass, dew is not attached in a forced draft air duct with cold drain water. While being able to obtain the improvement of assembly precision to ventilation systems, such as a blower and a nose, by unifying an order drain pan according to invention of claim 2, generating of the noise (PISHI sound) by thermal expansion etc. is

prevented.

[0085] According to invention of claim 3, since the order drain pan made mutually the protrusion direction of the rib which constitutes a drain pan the same include angle of the same direction, in these manufactures, the direction of mold omission from metal mold is in agreement, and it ends with the metal mold of a simple configuration.

[0086] Since the gutter was located in the side edge section of a forced draft air duct, while there is little effect affect the ventilation engine performance according to invention of claim 4, there is little effect on the drain water by the wind of a blower, and it ends.

[0087] According to invention of claim 5, the back drain pan has negative pressure from a setup of that location, the air from a back drain pan is inhaled in a forced draft air duct from an exhaust-port soma, but this air is the air which heat exchange is already carried out by the heat exchanger, and can draw a forced draft air duct, and does not have generating with dew.

[0088] According to invention of claim 6, since top-face opening of a gutter is closed with a lid implement, invasion of the dust into a gutter is prevented and plugging in the gutter by dust is prevented. According to invention of claim 7, since the lid implement corresponding to the vertical section of a gutter is formed in the pipe section, drain water does not ooze from the clearance between a lid implement and a gutter to the exterior.

[0089] According to invention of claim 8, an ingredient can be moved to a before side from a backplate, and even a motor can do cleaning and exchange of a fan motor easily. And two components with an ingredient are formed by one, and even a lid implement and a motor obtain reduction and cost reduction of components mark.

[0090] According to invention of claim 9, the bearing base can move freely and can maintain exchange of a blower etc. easily. And two components of a lid implement and the bearing base are formed by one, and reduction and cost reduction of components mark are obtained.

According to invention of claim 10, when a lid implement top face serves as the lap section which carries out a lap to the cross flow fan which constitutes a blower, ventilation performance degradation can be prevented certainly.

[Translation done.]

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3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing of longitudinal section of the unit in an air-conditioning cabin showing the gestalt of operation of this invention.

[Drawing 2] The decomposed perspective view explaining the supporting structure of an indoor blower to a backplate which shows the gestalt of this operation.

[Drawing 3] Even the backplate, **** implement, and motor in which the gestalt of this operation is shown are the decomposed perspective view with an ingredient.

[Drawing 4] The perspective view in the condition which shows the gestalt of this operation that fitted the **** implement into the right gutter of a backplate, and even the motor closed the ingredient.

[Drawing 5] The perspective view by the side of the motor presser-foot implement in the condition of having attached the indoor blower and the heat exchanger to the backplate showing the gestalt of this operation.

[Drawing 6] The decomposed perspective view of the backplate, the **** implement, and the bearing base in which the gestalt of this operation is shown.

[Drawing 7] The perspective view in the condition which shows the gestalt of this operation of having fitted the lid implement into the left gutter of a backplate, and having closed the bearing base.

[Drawing 8] The perspective view by the side of the bearing base in the condition of having attached the indoor blower and the heat exchanger to the backplate showing the gestalt of this operation.

[Drawing 9] The anchoring Fig. of a lid implement to a backplate showing the gestalt of this operation.

[Drawing 10] Drawing explaining the manufacture of a backplate which shows the gestalt of this operation.

[Description of Notations]

2a, 2b -- (anterior part, upper part) Absorption opening, 20 -- An exit cone, 4 -- Front panel, 3 [-- Backside heat exchanger,] -- A backplate, 1 -- A unit body, 7A -- A before side heat exchanger, 7B 7 [-- Before drain pan,] -- A heat exchanger, 18 -- A forced draft air duct, 11 -- An indoor blower, 9A 9B [-- An exhaust-port soma, 28a / -- The receptacle section, 28b / -- A vertical section, 28c / -- A horizontal level, 23A / -- A **** implement, 30 / -- A hinge region, 21 / -- Even a motor is an ingredient and 23B. / -- A **** implement, 39 / -- The string section, 22 / -- Bearing base.] -- An after drain pan, 91A, 91B -- A rib, 17A -- A right gutter, 27

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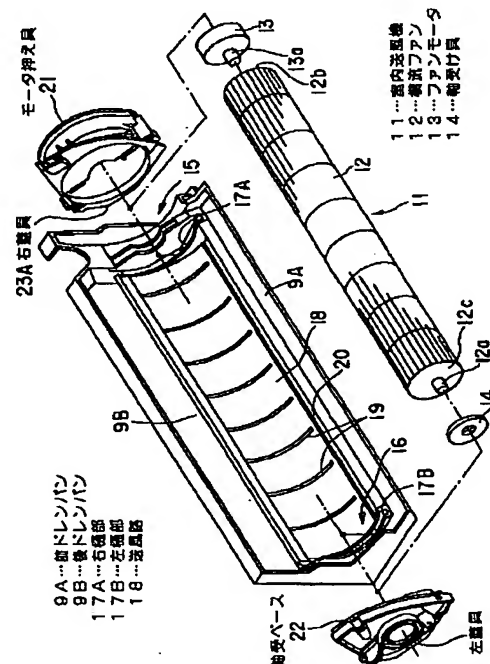
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(54) 【発明の名称】 空気調和機の室内ユニット

(57) 【要約】

【課題】ドレン水の有効処理を図り、結露の生成を阻止して快適空調を確保するとともに、製作および組立ての簡単化を図り、コストの低減を得られる空気調和機の室内ユニットを提供する。

【解決手段】吸込み口2a、2bと吹出し口20を備え、前面パネル2および後板3とから構成されるユニット本体1、側面視で逆V字状となし前側熱交換器7Aと後側熱交換器7Bとから構成される熱交換器7、吸込み口から被空調室空気を吸込んで熱交換器に流通させ、熱交換したあと送風路18を介して吹出し口から送風する送風機11とを具備し、前側熱交換器と後側熱交換器のそれぞれ下部に配置される前ドレンパン9Aおよび後ドレンパン9B、送風路の内側に位置し、かつ前ドレンパンと後ドレンパン相互に亘って架設され、後ドレンパンに集水されたドレン水を前ドレンパンへ流通案内する左右樋部17A、17Bとを具備した。



【特許請求の範囲】

【請求項1】吸込み口および吹出し口を備え、前面パネルおよび後板とから構成されるユニット本体と、このユニット本体内に配置され、側面視で逆V字状となし、上記ユニット本体の前面側に位置する前側熱交換器および後面側に位置する後側熱交換器とから構成される熱交換器と、

上記吸込み口から被空調室空気を吸込んで上記熱交換器に流通させ、ここで熱交換したあと送風路を介して吹出し口から送風する送風機とを具備した空気調和機の室内ユニットにおいて、

上記熱交換器を構成する前側熱交換器と後側熱交換器のそれぞれ下部に配置される前ドレンパンおよび後ドレンパンと、

上記送風路の内側に位置し、かつ前ドレンパンと後ドレンパン相互に亘って架設され、後ドレンパンに集水されたドレン水を前ドレンパンへ流通案内する樋部とを具備したことを特徴とする空気調和機の室内ユニット。

【請求項2】上記前ドレンパンと後ドレンパンおよびこれらを連通する上記樋部は、全て上記後板に一体的に形成されることを特徴とする請求項1記載の空気調和機の室内ユニット。

【請求項3】上記前ドレンパンおよび後ドレンパンを構成するリブは、互いに同一方向の同一角度に突出形成されることを特徴とする請求項2記載の空気調和機の室内ユニット。

【請求項4】上記樋部は、上記送風路の側端部に沿って設けられることを特徴とする請求項1および請求項2記載の空気調和機の室内ユニット。

【請求項5】上記後ドレンパンの端部は下方方向に開口する排水口体部となっており、

上記樋部は、その上端部に後ドレンパンの排水口体部から排水されるドレン水を受ける受け部およびこの受け部に連通され上記送風機の裏側に位置する垂直部と、この垂直部下端から送風機の下部側に沿って延出され、上記前ドレンパンに連通する水平部とから構成されることを特徴とする請求項4記載の空気調和機の室内ユニット。

【請求項6】上記樋部は、その上部開口に沿って、上部開口を閉成する蓋具が嵌着されることを特徴とする請求項4および請求項5記載の空気調和機の室内ユニット。

【請求項7】上記蓋具は、上記樋部の垂直部を閉成する部分の端部がパイプ部となっていて、上記後ドレンパンの排水口体部に嵌挿されることを特徴とする請求項6記載の空気調和機の室内ユニット。

【請求項8】上記蓋具は、前ドレンパン側の端部に設けられるヒンジ部を介して、上記送風機のファンモータを後板に押圧固定するモータ押さえ具が連結されることを特徴とする請求項6および請求項7記載の空気調和機の室内ユニット。

【請求項9】上記蓋具は、前ドレンパン側の端部に設け

られるヒモ部を介して、上記送風機の軸受け具を有する軸受けベースが連結されることを特徴とする請求項6および請求項7記載の空気調和機の室内ユニット。

【請求項10】上記蓋具は、その上面が上記送風機を構成する横流ファンの端板にラップするラップ部となることを特徴とする請求項6ないし請求項9記載の空気調和機の室内ユニット。

【発明の詳細な説明】

【0001】

10 【発明の属する技術分野】本発明は、特に、逆V字状に形成される熱交換器を備えた空気調和機の室内ユニットに係り、特に、上記熱交換器から滴下するドレン水の処理構造の改良に関する。

【0002】

【従来の技術】一般的に用いられる空気調和機は、被空調室に配置される室内ユニットと、屋外に配置される室外ユニットからなり、これらユニット相互を冷媒管および電気配線で接続してなる。

20 【0003】ユーザ側からは、これらユニットに対する小形化と、据付スペース低減の要望が大であり、各メーカーにおいては、このような条件を満足しつつ、熱交換能力の増大を図らなければならない。

【0004】その解決策の一つとして、たとえば実開平4-106425号公報に開示されるように、本体と前面パネルにそれぞれ対向するように逆V字状に形成して、前側熱交換器と後側熱交換器とからなる熱交換器を配置し、この熱交換器の下部に送風機を配置した空気調和機の室内ユニットがある。

30 【0005】このような形態の熱交換器であれば、熱交換面積を充分確保するとともに、熱交換器自体の高さ寸法を抑制し、それによってユニット本体の高さ寸法の低減化を得ている。

【0006】

【発明が解決しようとする課題】ところで、このような逆V字状に形成される熱交換器を備えると、熱交換作用にともなって前側熱交換器および後側熱交換器にドレン水が同時に生成される。これらドレン水は、各熱交換器の下部に配置されるドレンパンに滴下し、集水される。

40 【0007】ドレン水の処理については何らの問題もないが、前パネルと後板に対して、前側熱交換器のドレン水を受ける前ドレンパンと、後側熱交換器のドレン水を受ける後ドレンパンは、それぞれ別個に製作され、かつ組み立てられている。

【0008】そのため、部品点数が多くなって、それぞれを製作するのに必要な金型代がコストに悪影響を与えており、かつ組み立てた状態で互いの連結部分から熱膨張などによる騒音（ビシ音）の発生がある。

【0009】後側熱交換器下部の後ドレンパンで集水したドレン水を、ここに設けられる複数の排水口から排水するようになっているが、後ドレンパンの内側は送風機

回転時に負圧になっているので、排水口から熱交換前の生空気を吸ってしまう。

【0010】その結果、後ドレンパンの外周面に露付きが生じ易く、これらの露は送風路に滴下して、熱交換空気とともに被空調室へ吹出されることもあり、快適空調が損なわれる。

【0011】本発明は、上記事情に鑑みなされたものであり、その目的とするところは、逆V字状に形成される熱交換器を備えることを前提として、この熱交換器で生成されるドレン水を受けて、結露の生成を阻止し快適空調を確保するとともに、製作および組立ての簡単化を図り、コストの低減を得られる空気調和機の室内ユニットを提供しようとするものである。

【0012】

【課題を解決するための手段】上記目的を満足するため、本発明の空気調和機の室内ユニットは、請求項1として、吸込み口および吹出し口を備え、前面パネルおよび後板とから構成されるユニット本体と、このユニット本体内に配置され、側面視で逆V字状となし、上記ユニット本体の前面側に位置する前側熱交換器および後側に位置する後面側熱交換器とから構成される熱交換器と、上記吸込み口から被空調室空気を吸込んで上記熱交換器に流通させ、ここで熱交換したあと送風路を介して吹出し口から送風する送風機とを具備し、上記熱交換器を構成する前側熱交換器と後側熱交換器のそれぞれ下部に配置される前ドレンパンおよび後ドレンパンと、上記送風路の内側に位置し、かつ前ドレンパンと後ドレンパン相互に亘って架設され、後ドレンパンに集水されたドレン水を前ドレンパンへ流通案内する樋部とを具備したことを特徴とする。

【0013】請求項2として、請求項1記載の上記前ドレンパンと後ドレンパンおよびこれらを連通する上記樋部は、全て上記後板に一体的に形成されることを特徴とする。

【0014】請求項3として、請求項2記載の上記前ドレンパンおよび後ドレンパンを構成するリブは、互いに同一方向の同一角度に突出形成されることを特徴とする。請求項4として、請求項1および請求項2記載の上記樋部は、上記送風路の側端部に沿って設けられることを特徴とする。

【0015】請求項5として、請求項4記載の上記後ドレンパンの端部は下方向に開口する排水口体部となっており、上記樋部は、その上端部に後ドレンパンの排水口体部から排水されるドレン水を受ける受け部およびこの受け部に連通され上記送風機の裏側に位置する垂直部と、この垂直部下端から送風機の下部側に沿って延出され、上記前ドレンパンに連通する水平部とから構成されることを特徴とする。

【0016】請求項6として、請求項4および請求項5記載の上記樋部は、その上部開口に沿って、上部開口を

閉成する蓋具が嵌着されることを特徴とする。請求項7として、請求項6記載の上記蓋具は、上記樋部の垂直部を閉成する部分の端部がパイプ部となっており、上記後ドレンパンの排水口体部に嵌挿されることを特徴とする。

【0017】請求項8として、請求項6および請求項7記載の上記蓋具は、前ドレンパン側の端部に設けられるヒンジ部を介して、上記送風機のファンモータを後板に押圧固定するモータ押さえ具が連結されることを特徴とする。

【0018】請求項9として、請求項6および請求項7記載の上記蓋具は、前ドレンパン側の端部に設けられるヒモ部を介して、上記送風機の軸受け具を有する軸受けベースが連結されることを特徴とする。

【0019】請求項10として、請求項6ないし請求項9記載の上記蓋具は、その上面が上記送風機を構成する横流ファンの端板にラップするラップ部となることを特徴とする。

【0020】以上のような課題を解決するための手段を備えることにより、請求項1の発明において、送風路内側にドレン水を通すようにしたので、後側熱交換器から滴下したドレン水を一旦外部へ出す孔が不要となり、したがって外部の生空気を吸込まずにすみ、露付き現象がない。

【0021】請求項2の発明において、前後ドレンパンを一体化することによって、送風機やノーズなどの送風系に対する組立て精度の向上を得られるとともに、熱膨張などによる騒音（ビシ音）の発生を阻止する。

【0022】請求項3の発明において、前後ドレンパンとも、突出方向を同一方向としたので、これら製作にあたって、金型からの型抜き方向が一致し、単純な構成の金型ですむ。

【0023】請求項4の発明において、樋部を送風路の側端部に位置させたので、送風性能に及ぼす影響が少なくとともに、送風機の風によるドレン水への影響が少なくてすむ。

【0024】請求項5の発明において、後ドレンパンは、その位置の設定から負圧になっており、排水口体部より後ドレンパンからの空気が吸込まれるが、この空気は既に熱交換器で熱交換されて送風路を導かれる空気であり、露付きの発生がない。

【0025】請求項6の発明において、樋部の上部開口を蓋具で閉成するので、樋部内への塵埃の侵入を阻止し、塵埃による樋部内の詰まりが防止される。請求項7の発明において、樋部の垂直部に対応する蓋具がパイプ状に形成されるので、蓋具と樋部との隙間からドレン水が外部へ染み出ることがない。

【0026】請求項8の発明において、モータ押さえ具は後板から前側に動くことができ、ファンモータの掃除および交換作業が容易に行える。そして、蓋具とモータ

押さえ具との2部品が一体で形成され、部品点数の削減とコスト低減を得る。

【0027】請求項9の発明において、軸受けベースが自由に動くことができ、送風機の交換などのメンテナンスが容易に行える。そして、蓋具と軸受けベースとの2部品が一体で形成され、部品点数の削減とコスト低減を得る。請求項10の発明において、蓋具上面が送風機を構成する横流ファンの端板にラップするラップ部となることによって、送風性能の低下を確実に防止できる。

【0028】

【発明の実施の形態】以下、本発明の実施の形態を、図面を参照して説明する。図1に示すように、空気調和機の室内ユニットが構成される。空気調和機本体であるユニット本体1は、前面パネル2と後述する後板3とから構成される。上記前面パネル2の前面側にはグリル4が嵌め込まれた前部吸込み口2aが開口され、上面にはグリル5が嵌め込まれた上部吸込口2bが開口される。

【0029】ユニット本体1内には、各吸込口2a、2bに亘って対向するよう緩やかな円弧状に曲成されるエアフィルタ6と、逆V字状に形成される熱交換器7とが配置される。

【0030】熱交換器7は、前部吸込み口2aに対向する前側熱交換器7Aと、上部吸込み口2bに対向する後側熱交換器7Bとから構成される。特に、後側熱交換器7Bの上面に沿って補助熱交換器8が配置されていて、上部吸込み口2bとの間に介在される。

【0031】この熱交換器7を構成する前側熱交換器7A下端部は低い位置にあり、この下部には前ドレンパン9Aが配置される一方、後側熱交換器7B下端部は高い位置にあり、この下部には後ドレンパン9Bが配置される。これら前、後ドレンパン9A、9Bは、上記後板3に一体に設けられるとともに、図10に示すように、前ドレンパン9Aを構成するリブ91Aと、後ドレンパン9Bを構成するリブ91Bとが同一方向に突設されている。なお、同図において90A～90Eは後板3を射出成形するための金型である。

【0032】逆V字状に形成される上記熱交換器7の内部位置、すなわちこの前側熱交換器7Aと後側熱交換器7Bとの間に配置され、これら熱交換器に覆われるようにして室内送風機11が配置される。

【0033】図2にも示すように、上記室内送風機11は、上記熱交換器7の幅寸法と同一の軸方向寸法の横流ファン12と、この横流ファン12の一側部側の端板12bに回転軸13aを介して連結されるファンモータ13および横流ファン12の他側部の端板12cに突設される支軸12aを枢支する軸受け具14とから構成される。

【0034】一方、上記後板3の長手方向の一側部（右側部）には、第1の送風機支持部15が一体に形成され、他側部（左側部）には、第2の送風機支持部16が

一体に形成される。

【0035】これら送風機支持部15、16のそれぞれ内側部は狭い幅寸法で凹陷形成されており、この凹陷部を右樋部17A、左樋部17Bと呼ぶ。そして、両樋部17A、17B相互間には、送風路18が形成されており、ここには長手方向に所定の間隔を存して補強用のリブ19…が突設される。

【0036】上記送風路18の手前側端部に沿って、吹出し口20が開口される。上記前ドレンパン9Aは、この吹出し口20の手前側端部に沿って設けられ、上記後ドレンパン9Bは、上記送風路18の上部側に沿って設けられることになる。

【0037】上記左右樋部17A、17Bは、その上端部が後ドレンパン9Bの両側端部と連通し、その下端部が前ドレンパン9Aの両側端部と連通している。すなわち、両樋部17A、17Bは、後ドレンパン9Bと前ドレンパン9Aとを連通する連通路を構成する。

【0038】上記第1の送風機支持部15には、室内送風機11を構成するファンモータ13が支持され、さらにこのファンモータ13をモータ押さえ具21が押さえ、第1の送風機支持部15に取付け固定するようになっている。

【0039】第2の送風機支持部16には、室内送風機11を構成する軸受け具14が支持固定された軸受けベース22が取付けられる。上記モータ押さえ具21と軸受けベース22には、それぞれ右蓋具23A、左蓋具23Bが一体に連結されている。これら左右蓋具23A、23Bは各送風機支持部15、16の内側に形成される上記左右樋部17A、17Bにそれぞれ嵌め込まれ、この上部開口を閉成するようになっている。

【0040】つぎに、上記第1の送風機支持部15におけるファンモータ13の支持構造について詳述する。図3に示すように、送風路18の側端部には、内縁が円弧状の送風路端板25が立設され、この送風路端板25と所定の間隔を存して、第1の送風機支持部15を構成する当て板26Aが立設されている。

【0041】これら送風路端板25と当て板26Aとの間の空間部が上記右樋部17Aとなっている。換言すれば、右樋部17Aは送風路端板25と当て板26Aとの間に凹陷形成され、送風路18の内側端部に沿って、後板3に一体に形成される。

【0042】図9に示すように、後ドレンパン9Bの側端部には、下方に開口する排水口体部27が設けられ、右樋部17Aの上端である受け部28aに連通する。この受け部28aの下方部位は垂直部28bであり、垂直部28b下端からはほぼ水平方向に延出して、その前端部が上記前ドレンパンに連通する水平部28cとなっている。

【0043】組み立てられた状態で、上記室内送風機11を構成する横流ファン12に対して、右樋部17Aの

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垂直部28bは横流ファン12の裏側に位置し、水平部28cは横流ファン12の下部側に位置することになる。

【0044】再び図3に示すように、上記当て板26Aの端縁は半円状に形成される。この当て板26Aと平行に受け板26Bが立設されていて、この端縁は当て板端縁よりもある程度大きな半円状に形成される。

【0045】上記受け板26Bの側部は、大きな曲率半径の円弧状に形成されていて、ここを支持部28と呼ぶ。上記右樋部17Aには、右蓋具23Aが嵌着される。すなわち、右樋部17Aを構成する受け部28aと垂直部28bおよび水平部28cはともに、断面がU字状に形成されて上部が開放されており、この開口を断面が逆U字状に形成される右蓋具23Aによって閉成される。

【0046】右蓋具23Aの、特に、受け部28aと垂直部28bに対応する端部は、断面矩形状のパイプ部29を備えている。そしてこのパイプ部29は、上記後ドレンパン9Bの排水口体部27に挿嵌される。

【0047】右蓋具23Aの上記パイプ部29と反対側の端部は、いわゆるP-Pヒンジ部30を介して上記モータ押さえ具21が一体に連結される。上記モータ押さえ具21は、半円状に形成される押さえ部31と、この押さえ部31のほぼ中央部に互いに狭小の間隙を存して一体に突設される押さえ板32a、32bと、右蓋具23Aと対向する部位の押さえ部31側縁に沿って外方へ一体に突設される閉塞板部33とから構成される。

【0048】上記押さえ板32aの内縁は、当て板26A内縁と同一曲率の半円状に形成され、上記押さえ板32b内縁は受け板26B内縁と同一曲率の半円状に形成される。また、上記押さえ部31は、右蓋具23A内縁と同一の曲率半径である。

【0049】図4に示すように、右蓋具23Aが右樋部17Aに嵌め込まれ、この右樋部の上部開口が閉成された状態で、右蓋具23A上面は横流ファン12の端板12bとラップする。そして、ヒンジ部30を支点としてモータ押さえ具21を後部側に回動変位すると、右蓋具23A内縁および押さえ部31とで円形部が形成される。

【0050】同時に、当て板26Aと一方の押さえ板32a、受け板26Bと他方の押さえ板32bのそれぞれ内縁相互が対向し、所定の直径の円形部が形成され、他方の押さえ部31と支持部28とで一つの円形部が形成される。

【0051】図5に示すように、後板3に室内送風機11および熱交換器7を配置する。すなわち、先に説明したように右樋部17Aに右蓋具23Aを嵌合し、かつヒンジ部30を支点としてモータ押さえ具21を手前側に回動して第1の送風機支持部15を空ける。

【0052】そして、室内送風機11を構成するファン

モータ13を第1の送風機支持部15に置き、モータ押さえ具21を回動してファンモータ13の周面に沿わせ、固定ねじ35で後板3に取付け固定する。(固定部分は図9に示す)

この状態で、ファンモータ13の周面は、第1の送風機支持部15の支持部28と、モータ押さえ具21の押さえ部31とがなす円形部に嵌合される。また、ファンモータ13の一側部に突設される、ここでは図示しないボス部周面は受け板26Bと押さえ板32bのそれぞれ内縁相互がなす円形部に嵌合される。

【0053】ファンモータ13の軸方向位置は、上記ボス部端面が当て板26Aと押さえ板32aの内縁相互がなす円形部に当接することにより位置決めされる。ファンモータ13の手前側に突設されるボス部13bは、2つ割りにされた別の押さえ具36によって支持され、このようにしてファンモータ13は確実に後板3に取付け固定される。

【0054】後述するようにして、軸受け具14側の取付けをなしてから、上記熱交換器7を所定位置に配置することにより、同図に示すような組立てが完了する。つぎに、上記第2の送風機支持部16における軸受け具14の支持構造について詳述する。

【0055】図6に示すように、送風路18の側端部には、内縁が円弧状の送風路端板37が立設され、この送風路端板37と所定の間隔を存して、第2の送風機支持部16を構成する受け板38が立設されている。

【0056】これら送風路端板37と受け板38との間の空間部が上記左樋部17Bとなっている。換言すれば、左樋部17Bは送風路端板37と受け板38との間に凹陥形成され、送風路18の内側端部に沿って、後板3に一体に形成される。

【0057】この第2の送風機支持部16側の後ドレンパン9B側端部は、先に説明した第1の送風機部15と同様な排水口体部27となっており、左樋部17Bの上端である受け部28aに連通する。そして、受け部28aは垂直部28bを介して水平部28cに連通する。したがって、組み立てられた状態で、垂直部28bが横流ファン12の裏側に位置し、水平部28cが横流ファン12の下部側に位置する。

【0058】上記左樋部17Bの上面開口を閉成する左蓋具23Bが嵌着される。この左蓋具23Bも先に説明した第1の送風機部15と同様な形状であるので、同番号を付して新たな説明は省略する。

【0059】パイプ部29とは反対側の端部は、ヒモ部39を介して上記軸受けベース22が一体に連結される。また軸受けベース22は、リング状の嵌着部40と、この嵌着部40の周囲に外方へ一体に突設される閉塞板部41および取付け用孔を備えた複数の取付け片部42…および複数のねじ孔部43…とから構成される。

【0060】図7に示すように、左蓋具23Bが左樋部

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17 Bに嵌め込まれ、左樋部の上部開口が閉成された状態で、左蓋具23 B上面は横流ファン12の端板12 cとラップする。そして、ヒモ部39を支点として軸受けベース22を受け板38に当接し、閉塞板部41端部を受け板38上端縁に載置する。この状態で閉塞板部41に設けられる取付け片部42の取付け用孔が第1の送風機支持部15側と同様に後板3に形成されたねじ孔部(図示せず)に対向する。

【0061】図8に示すように、後板3に室内送風機11および熱交換器7を配置する。すなわち、先に説明したように、左樋部17 Bに左蓋具23 Bを嵌合した上、ヒモ部39を支点として軸受けベース22を一旦左蓋具23 Bから外側へ逃がして第2の送風機支持部16を空ける。

【0062】室内送風機11を構成する軸受け具14を軸受けベース22の嵌着部40に嵌着させ、この軸受けベース22を外側から左蓋具23 B側へ移動させて、横流ファン12の支軸12 aを軸受け具14に挿入する。

【0063】そのあと、軸受けベース22を第2の送風機支持部16に載置することによって、必然的に、取付け片部42の取付け用孔が第2の送風機支持部16に一体に設けられるねじ孔部に連通するので、固定ねじで軸受けベース22を後板3に取付け固定する。

【0064】そして、上記熱交換器7を所定位置に配置し、この熱交換器端板7 cに設けられる取付用孔を軸受けベース22のねじ孔部43に対向させ、固定ねじ35で取付固定する。したがって、軸受けベース22は軸受け具14を支持した状態で後板3に取付け固定されることになる。

【0065】このようにして構成される室内ユニットであり、熱交換器7に対する冷凍サイクル運転をなすとともに室内送風機11を駆動して横流ファン12を回転することにより、被空調室内空気が前部吸込口2 aと上部吸込口2 bからユニット本体1内に吸込まれ、熱交換器7を通過して熱交換をなす。熱交換した後の熱交換空気は、送風路18に案内され吹出口20から被空調室内へ吹出される。

【0066】なお、モータ押さえ具21と、軸受けベース22にそれぞれ一体に突設される閉塞板部33、41は、逆V字状に形成される熱交換器7の内側端部に挿入される。したがって、逆V字状熱交換器7の側端部に形成される空間を閉塞して、ここから生空気が吸込まれることを阻止する。

【0067】冷房運転時の場合は、熱交換器7にドレン水が生成して滴下する。前側熱交換器7 Aから滴下するドレン水は前ドレンパン9 Aが受け、後側熱交換器7 Bおよび補助熱交換器8から滴下するドレン水は後ドレンパン9 Bが受ける。

【0068】後ドレンパン9 Bが前ドレンパン9 Aよりも高位にあるところから、後ドレンパン9 Bに集水され

たドレン水は、両側端部に形成される左右樋部17 A、17 Bに流通し、前ドレンパン9 Aに集水される。そして、前ドレンパン9 Aから一括して室外へ排水処理される。

【0069】このように、ドレン水を導く左右樋部17 A、17 Bが熱交換された空気の通る送風路18の内側に位置するので、冷えたドレン水によって左右樋部17 A、17 Bに露が付くことがない。さらに、従来例の構成のような後ドレンパン9 Bに外部排水孔が不要となり、したがって外部の生空気を吸込まずにすみ、露付き現象がない。

【0070】後板3に、前後ドレンパン9 A、9 Bを一体に形成することによって、送風機11やノーズなどの送風系に対する組立て精度の向上を得られるとともに、連結部がないので、熱膨張などによる騒音(ピン音)が発生しない。

【0071】さらに、前ドレンパン9 Aを構成するリブ91 Aと後ドレンパン9 Bを構成するリブ91 Bとが同一方向に突設されている。このことから図10に示すように、前ドレンパン9 Aと後ドレンパン9 Bの型抜き方向が一致しているので、後板3を射出成形するための金型90 A~90 Eのうち、特に金型90 Aは前ドレンパン9 A用と後ドレンパン9 B用とを別々に構成することなく、単一の金型で構成することができる。

【0072】上記左右樋部17 A、17 Bを送風路18の側端部に位置させたので、送風性能に及ぼす影響が少なくともに、送風機11の風によるドレン水への影響が少なくすむ。

【0073】後ドレンパン9 Bの空気が排水口体部27から左右樋部17 A、17 Bに吸込まれることを阻止できないが、この空気は既に熱交換器11で熱交換された空気であり、したがって露付きの発生がない。

【0074】左右樋部17 A、17 Bの上面開口は、それぞれ左右蓋具23 A、23 Bで閉成されることから、樋部内への塵埃の侵入を確実に阻止でき、塵埃による内部の詰まりが防止される。

【0075】すなわち、垂直部28 bに対してU字状の蓋とした場合、左右蓋具23 A、23 Bと左右樋部17 A、17 Bとの隙間からドレン水が外部へ染み出る恐れがあるがパイプ部29としたので、左右樋部17 A、17 Bの垂直部28 bと左右蓋具23 A、23 Bとの隙間にドレン水が侵入することがなく、この隙間から染み出ることがない。

【0076】左右蓋具23 A、23 B上面を横流ファン12の左右端板12 b、12 cとラップするようにしたので、送風路18からの左右の端板12 b、12 c付近への空気の逃げを極力防止することができ、送風性能の低下を確実に防止できる。

【0077】上記モータ押さえ具21は、ヒンジ部30を支点として後板3側から手前側に動くことができ、こ

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れによって横流ファン12の掃除および交換などのメンテナンス作業が容易に行える。

【0078】なお、モータ押さえ具21は上記作業のために動き得る必要があるが、このとき右蓋具23Aが追従して動いてしまうと、嵌め込まれた右樋部17Aから抜け出る恐れがあるので、動いてはならない。

【0079】したがって、モータ押さえ具21と右蓋具23Aをヒンジ部を30介して連結し、モータ押さえ具21の動きが右蓋具23Aに影響を与えないようにした。さらに、右蓋具23Aとモータ押さえ具21との2部品を一体に形成して、部品点数の削減とコスト低減を得る。

【0080】上記軸受けベース22は後板3に対してから前後左右に動くことができ、これによって横流ファン12の掃除および交換などのメンテナンス作業が容易に行える。

【0081】軸受けベース22は上記作業のために動き得る必要があるが、このとき左蓋具23Bが追従して動くとき左樋部17Bから抜け出る恐れがあるので、動いてはならない。

【0082】したがって、軸受けベース22と左蓋具17Bをヒモ部39を介して連結し、軸受けベース22の動きが左蓋具17Bに影響を与えないようにした。さらに、左蓋具17Bと軸受けベース22との2部品を一体に形成して、部品点数の削減とコスト低減を得る。

【0083】

【発明の効果】以上説明したように請求項1の発明によれば、送風路の内側にドレン水を通すようにしたので、後側熱交換器から滴下したドレン水を一旦外部へ出す孔が不要となり、したがって外部の生空気を吸込まずにすみ、露付き現象がない。

【0084】しかも、ドレン水は熱交換された空気を通る送風路の内側を通すので、冷えたドレン水によって送風路内に露が付くこともない。請求項2の発明によれば、前後ドレンパンを一体化することによって、送風機やノーズなどの送風系に対する組立て精度の向上を得られるとともに、熱膨張などによる騒音（ビシ音）の発生を阻止する。

【0085】請求項3の発明によれば、前後ドレンパンとも、ドレンパンを構成するリブの突出方向を互いに同一方向の同一角度としたので、これら製作にあたって、金型からの型抜き方向が一致し、単純な構成の金型ですむ。

【0086】請求項4の発明によれば、樋部を送風路の側端部に位置させたので、送風性能に及ぼす影響が少なくとともに、送風機の風によるドレン水への影響が少なくすむ。

【0087】請求項5の発明によれば、後ドレンパンは、その位置の設定から負圧になっており、排水口体部より後ドレンパンからの空気が送風路内に吸込まれる

が、この空気は既に熱交換器で熱交換されて送風路を導かれる空気であり、露付きの発生がない。

【0088】請求項6の発明によれば、樋部の上面開口を蓋具で閉成するので、樋部内への塵埃の侵入を阻止し、塵埃による樋部内の詰まりが防止される。請求項7の発明によれば、樋部の垂直部に対応する蓋具がパイプ部に形成されるので、蓋具と樋部との隙間からドレン水が外部へ染み出ることがない。

【0089】請求項8の発明によれば、モータ押さえ具は後板から前側に動くことができ、ファンモータの掃除および交換作業が容易に行える。そして、蓋具とモータ押さえ具との2部品が一体で形成され、部品点数の削減とコスト低減を得る。

【0090】請求項9の発明によれば、軸受けベースが自由に動くことができ、送風機の交換などのメンテナンスが容易に行える。そして、蓋具と軸受けベースとの2部品が一体で形成され、部品点数の削減とコスト低減を得る。請求項10の発明によれば、蓋具上面が送風機を構成する横流ファンにラップするラップ部となることによって、送風性能の低下を確実に防止できる。

【図面の簡単な説明】

【図1】本発明の実施の形態を示す、空気調和機室内ユニットの縦断面図。

【図2】同実施の形態を示す、後板に対する室内送風機の支持構造を説明する分解した斜視図。

【図3】同実施の形態を示す、後板と右蓋具とモータ押さえ具との分解した斜視図。

【図4】同実施の形態を示す、後板の右樋部に右蓋具を嵌合し、かつモータ押さえ具を閉じた状態での斜視図。

【図5】同実施の形態を示す、後板に対して室内送風機および熱交換器を取付けた状態のモータ押さえ具側の斜視図。

【図6】同実施の形態を示す、後板と左蓋具と軸受けベースとの分解した斜視図。

【図7】同実施の形態を示す、後板の左樋部に蓋具を嵌合し、かつ軸受けベースを閉じた状態での斜視図。

【図8】同実施の形態を示す、後板に対して室内送風機および熱交換器を取付けた状態の軸受けベース側の斜視図。

【図9】同実施の形態を示す、後板に対する蓋具の取付け図。

【図10】同実施の形態を示す、後板の製作を説明する図。

【符号の説明】

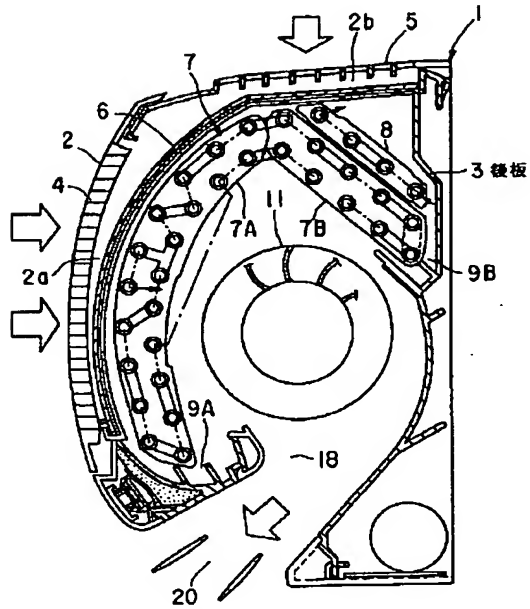
2a、2b…（前部、上部）吸込み口、20…吹出し口、4…前面パネル、3…後板、1…ユニット本体、7A…前側熱交換器、7B…後側熱交換器、7…熱交換器、18…送風路、11…室内送風機、9A…前ドレンパン、9B…後ドレンパン、91A、91B…リブ、17A…右樋部、27…排水口体部、28a…受け部、2

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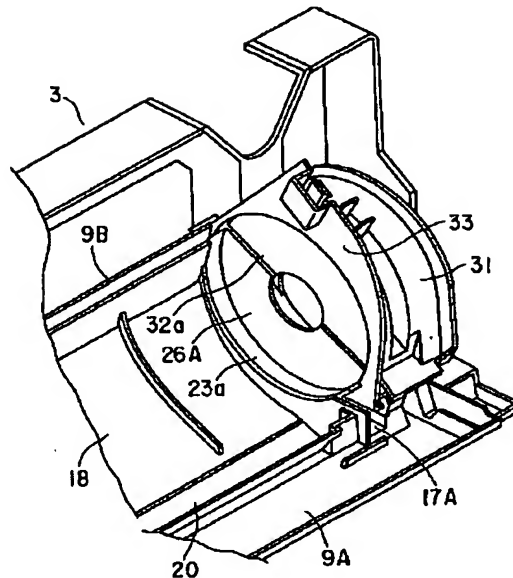
14

8b…垂直部、28c…水平部、23A…右蓋具、30 * 39…ヒモ部、22…軸受けベース。
 …ヒンジ部、21…モータ押さえ具、23B…左蓋具、*

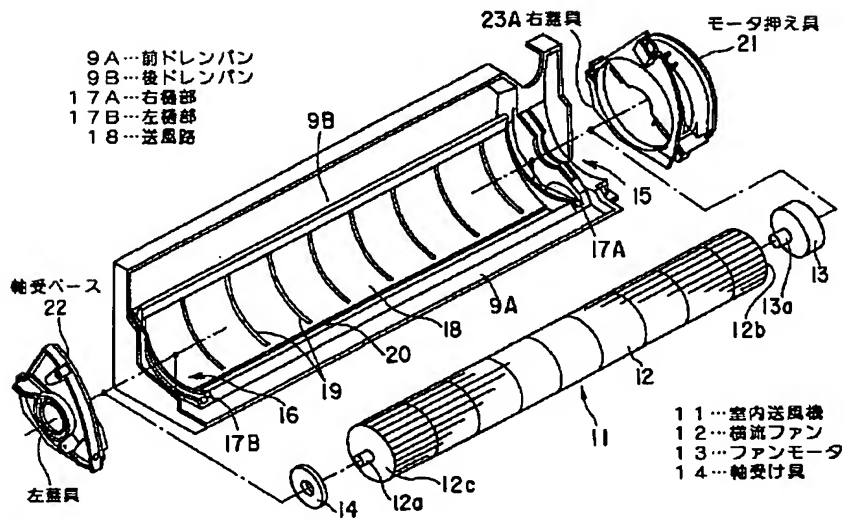
【図1】



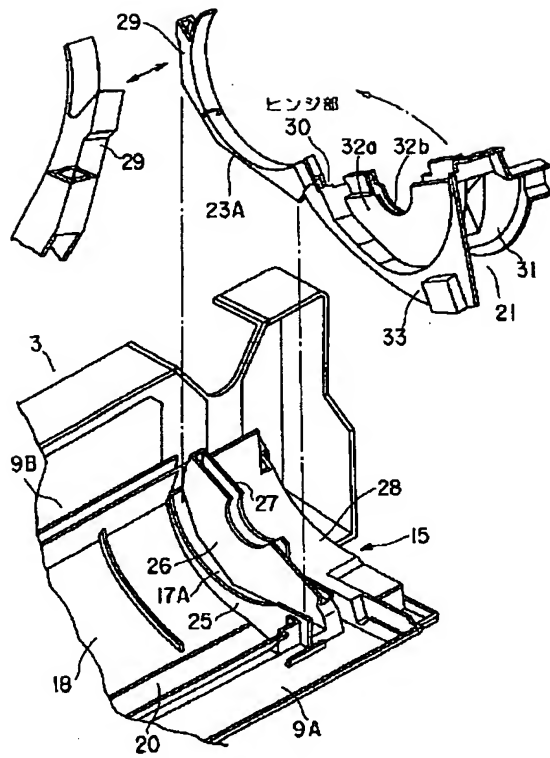
【図4】



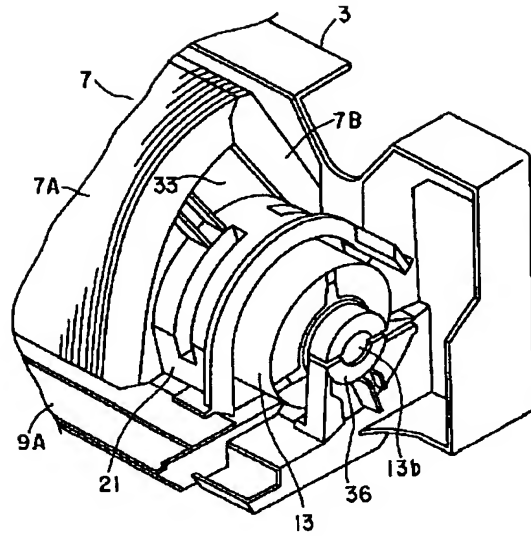
【図2】



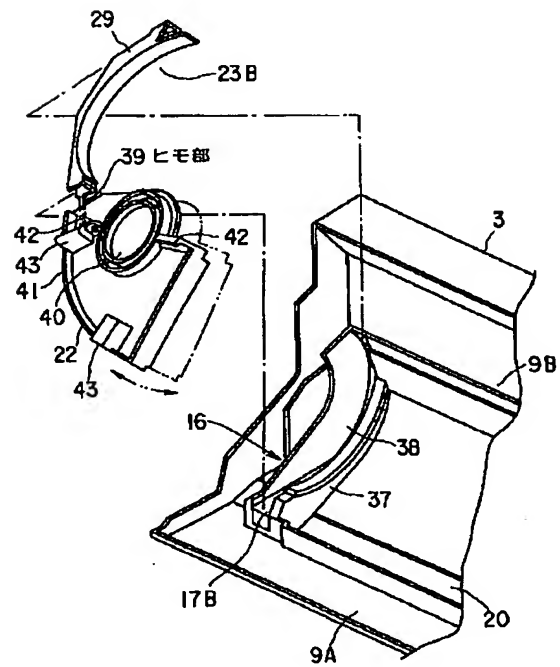
【図3】



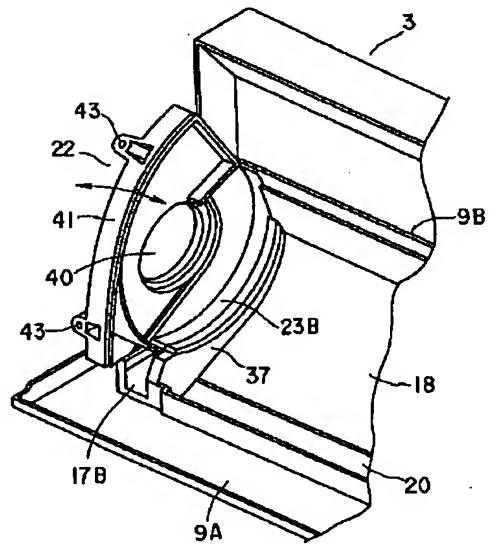
【図5】



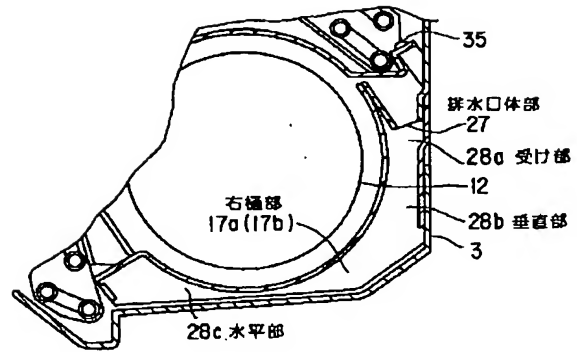
【図6】



【図7】



【圖9】



【図 10】

